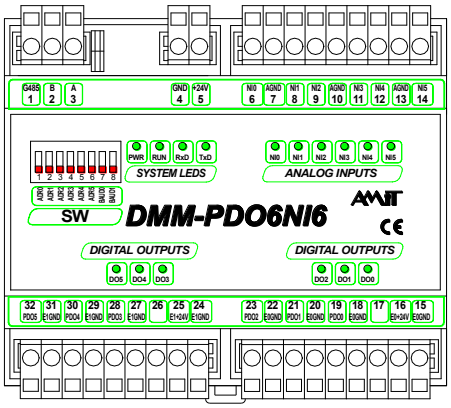
DMM-PDO6NI6

Combined module with protocol MODBUS

- **6 digital outputs 24 V DC with GI**
- **6 inputs Ni1000**
- **PWM mode possibility for DO**
- **Inputs without galvanic isolation**
- **Operation through RS485 interface, protocol MODBUS RTU**



TECHNICAL DATA

Inputs	6 × Ni1000
Accuracy, Ni1000/6180 Depends on measured value, for another values needs to be interpolated.	T = -50 °C 0.6 °C T = 0 °C 0.8 °C T = 150 °C 1.5 °C
Converter resolution	12 bits
Temperature dependence	70 ppm/°C
Common wire	Analogue ground
Input overvoltage protection	Diodes
Outputs	6 × 24 V DC
Switched voltage tolerance	24 V DC ±20 %
Switch type	Switches Ex+24V
Switching element	MOS
Safe state user definition	Not supported
Galvanic isolation of outputs	Yes *)
Current protection maximum current	0.7 A to 2.5 A DC
Switched current (permanent)	1 A DC
Contact closing time	40 µs
Contact opening time	100 µs
Short-circuits protection	Electronic
Inductive load handling	Transil 600 W
Communication	RS485
Interface galvanic isolation	Yes *)
Overvoltage interface protection	Transil 600 W
Communication speeds	9600 bps to 57600 bps
Number of modules on RS485 network	63
Number of modules on RS485 segment	31
Power supply	19.2 V to 28.8 V DC
Power consumption (without outputs)	Max. 150 mA at 24 V DC
Others	
Connection	Cage clamps WAGO 231
Ingress protection rate	IP20
Operating temperature range	0 °C to 50 °C
Maximum ambient humidity	< 95 % non-condensing
Mounting	DIN rail 35 mm
Weight	250 g
Dimensions (w × h × d)	(106 × 97 × 73) mm

*) Insulation strength 500 V AC / 1 minute, galvanic isolation must not be used for safe and unsafe parts separation.

ORDERING INFORMATION

DMM-PDO6NI6	Module of 6 analogue inputs and 6 digital outputs with protocol MODBUS, connector WAGO

AMiT, spol. s r.o., Naskové 1100/3, 150 00 PRAGUE, Czech Republic
Tel.: +420 222 780 100, +420 222 781 516, Fax: +420 222 782 297
e-mail: amit@amit.cz

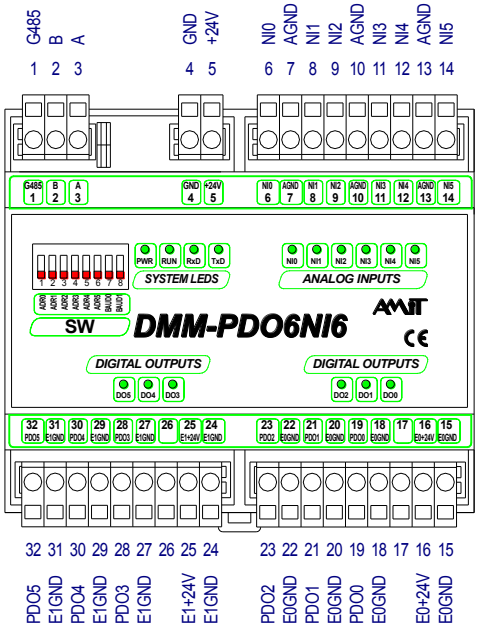
Technical support: support@amit.cz
Tel.: +420 549 210 276, +420 549 210 403
www.amit.cz/support

TERMINALS IDENTIFICATION

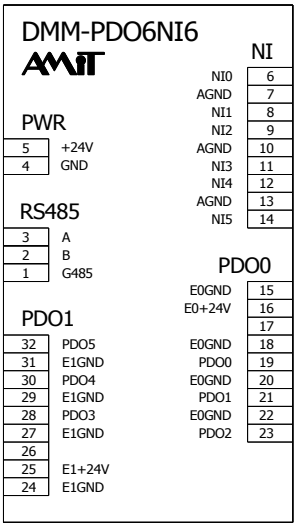
Terminal	Signal	Description
1	G485	RS485, shielding
2	B	RS485, wire B
3	A	RS485, wire A
4	GND	Power supply, ground
5	+24V	Power supply +24 V DC
6	NI0	Input NI0
7	AGND	Analogue ground
8	NI1	Input NI1
9	NI2	Input NI2
10	AGND	Analogue ground
11	NI3	Input NI3
12	NI4	Input NI4
13	AGND	Analogue ground
14	NI5	Input NI5
15	E0GND	External GND
16	E0+24V	Switched voltage PDO0 to 2

Terminal	Signal	Description
17	–	
18	E0GND	External GND
19	PDO0	Output 0
20	E0GND	External GND
21	PDO1	Output 1
22	E0GND	External GND
23	PDO2	Output 2
24	E1GND	External GND
25	E1+24V	Switched voltage PDO3 to 5
26	–	
27	E1GND	External GND
28	PDO3	Output 3
29	E1GND	External GND
30	PDO4	Output 4
31	E1GND	External GND
32	PDO5	Output 5

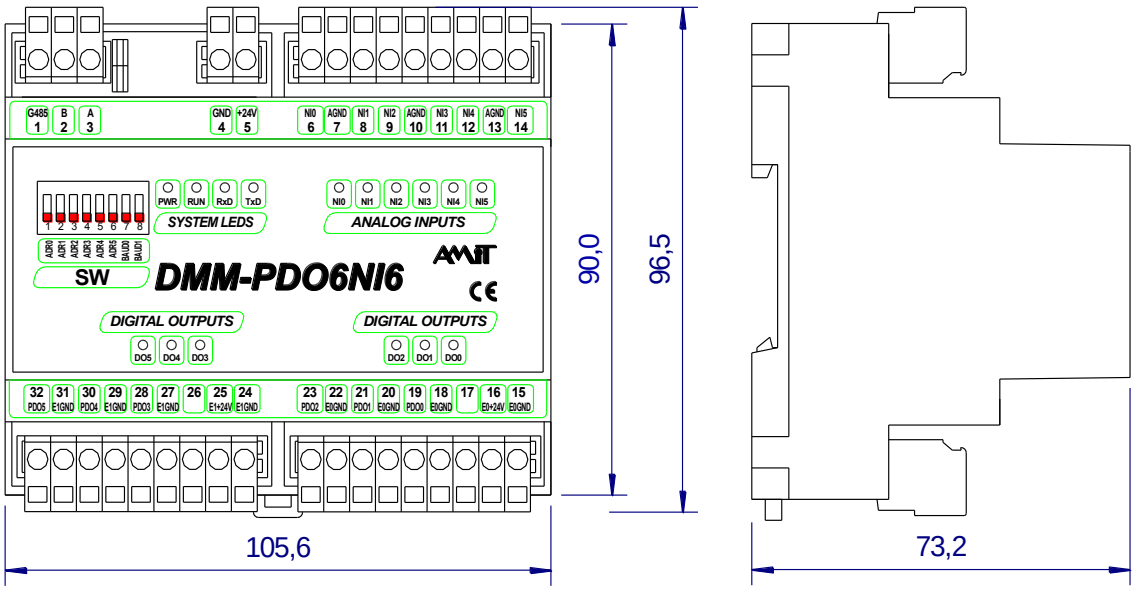
TERMINALS LOCATION



RECOMMENDED DRAWING SYMBOL



MECHANICAL DIMENSIONS



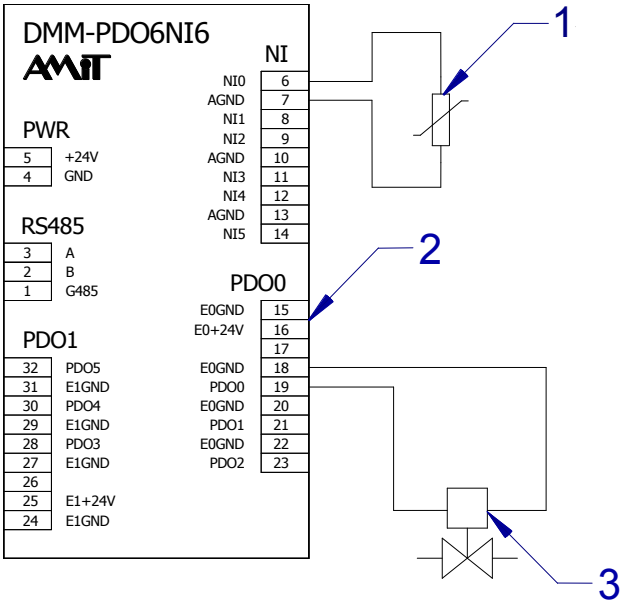
DMM-PDO6NI6

Combined module with protocol MODBUS

JUMPERS – RS485 INTERFACE

Jumper	Description
J5, 1-2	Idle state line definition + A termination
J5, 3-4	Idle state line definition + B termination

WIRING EXAMPLE



Legend

Number	Description
1	Resistive temperature sensor
2	Power supply for electro-thermal heads
3	Electro-thermal heads

PARITY SETTINGS

Turn the unit power supply off, set all switches to OFF position and turn the power supply on again. The parity can be set by the switches ADR0 (DIP 1) and ADR1 (DIP 2) according to a table:

ADR0 (DIP 1)	ADR1 (DIP 2)	Parity
OFF	OFF	None
ON	OFF	Even
OFF	ON	Odd

The settings must be confirmed by switching the switch BAUD1 (DIP 8) to a position ON (“light snake” is running on module LEDs). Parity settings are displayed on corresponding LEDs. A change will be active after turning the module off and on again.

SETTINGS OF ADDRESS AND COMMUNICATION SPEED

Address settings can be performed by the switches ADR0 (DIP 1) to ADR5 (DIP 6). Available address values are 1 to 63. **Address 0 is not allowed!** Communication speed settings can be performed by the switches BAUD0 (DIP 7) and BAUD1 (DIP 8).

ADDRESS

DIP	Value
ADR0 (DIP 1)	Value of 1
ADR1 (DIP 2)	Value of 2
ADR2 (DIP 3)	Value of 4
ADR3 (DIP 4)	Value of 8
ADR4 (DIP 5)	Value of 16
ADR5 (DIP 6)	Value of 32

COMMUNICATION SPEED

BAUD0 (DIP 7)	BAUD1 (DIP 8)	Communication speed
OFF	OFF	9600 bps
ON	OFF	19200 bps
OFF	ON	38400 bps
ON	ON	57600 bps

An example of address: address = 35, the switches 1, 2 and 6 (1 + 2 + 32) are ON. The change of switches settings will be active after turning the module off and on again.

AMiT, spol. s r.o., Naskové 1100/3, 150 00 PRAGUE, Czech Republic
Tel.: +420 222 780 100, +420 222 781 516, Fax: +420 222 782 297
e-mail: amit@amit.cz

Technical support: support@amit.cz
Tel.: +420 549 210 276, +420 549 210 403
www.amit.cz/support

SUPPORTED MODBUS FUNCTIONS

Function	Use
1	Reading of digital outputs state
3	Reading of set parameters for PWM
4	Reading of analogue values
5	Writing of one digital output
6	Writing of one PWM output parameter
15	Writing of multiple digital outputs
16	Writing of multiple PWM outputs parameters

Digital outputs are mapped to the network Modbus by the coils according to the table.

DMM-PDO6NI6 output	Modbus Coil number	Modbus Coil type	Description
DO0	0	R/W	DO0 switching-on / off
DO1	1	R/W	DO1 switching-on / off
…	…	…	…
DO4	4	R/W	DO4 switching-on / off
DO5	5	R/W	DO5 switching-on / off

The values of PWM duty cycle and period are mapped to the network Modbus by output registers (holding registers) according to the table.

DMM-PDO6NI6 output	Modbus HR number	Modbus HR type	Description
DO0	0	R/W	PWM duty cycle for output DO0
DO1	1	R/W	Duty cycle PWM for output DO1
…	…	…	…
DO4	4	R/W	PWM duty cycle for output DO4
DO5	5	R/W	Duty cycle PWM for output DO5
-	6	R/W	Period for all DO

The period PWM is common for all digital outputs. In register, it may have a value of 0 to 32767. This corresponds to a range 0 s to 100 s.
The PWM duty cycle may have a value 0 to 32767 in the registers. This corresponds to a range 0 % to 100%.

A real module state of digital output is a logical sum of value written to the coil and the value written to the corresponding holding register.

The values of individual inputs (read by A/D converters) are mapped to the network Modbus as input registers according to the table.

DMM-AI12 input	Modbus IR number	Modbus IR type	Description
AI0	0	R	Value read by A/D converter of input AI0
AI1	1	R	Value read by A/D converter of input AI1
…	…	…	…
AI5	5	R	Value read by A/D converter of input AI5

The value will be loaded in a range 0 to 32767 into the registers. This corresponds to a range 0 % to 100 % of analogue input. A method of read value to the measured temperature is mentioned in Application Note AP0008 – Communication in Network Modbus.

Warning: A unit has implemented SW **WATCHDOG**. If the unit does not receive (for 10 seconds) any valid frame (even for another unit on the network), all outputs are set to log. 0.